MEDICAL LIBRARY

SEP 6 1946

The American Journal of Medical Technology

JULY, 1946

Vol. 12, No. 4

OFFICIAL PUBLICATION
(Copyright 1946)
AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
Published Bi-Monthly by The American Society of Medical Technologists
Printed by The Gulf Publishing Company
Business Office: Medical Center Bldg., Lafayette, La.
Editorial Office: 2119 Arbor Ave., Houston 4, Texas
Printing Office: 3301 Buffalo Drive, Houston 6, Texas

DIFCO

Media for BLOOD CULTURE

Satisfactory media for culturing pathogenic bacteria from the blood stream are essential for a high percentage of positive isolations in bacteriemias.

Bacto-Brain Heart Infusion

is recommended for cultivation of many organisms which are generally considered difficult to propagate. It is an excellent liquid medium for cultivation of the Streptococci, Pneumococci and Meningococci. The addition of 0.1 per cent agar greatly enhances the value of the medium for blood culture work.

Bacto-Tryptose Phosphate Broth

a peptone medium without tissue infusion, supports luxuriant growth of many fastidious bacteria. Like Brain Heart Infusion, it is an excellent liquid substrate for Streptococci, Pneumococci and other pathogenic bacteria.

Bacto-Blood Agar Base

enriched with sterile defibrinated blood, permits development of clear and distinct zones of hemolysis by colonies of hemolytic bacteria. Blood Agar prepared from this medium is especially useful for identification of Streptococci.

Bacto-Tryptose Agar

is an excellent general culture medium for many types of bacteria. It is especially well suited for direct isolation of organisms from the blood stream. The dextrose present in this medium supports early and luxuriant growth of bacteria but renders it unsatisfactory as a base for blood agar for differentiation of cultures on the basis of hemolysis.

Specify "DIFCO"

THE TRADE NAME OF THE PIONEERS

In the Research and Development of Bacto-Peptone and Dehydrated Culture Media

DIFCO LABORATORIES

INCORPORATED

DETROIT 1, MICHIGAN

The
AMERICAN JOURNAL
of
MEDICAL TECHNOLOGY

VOLUME 12 JULY, 1946 NUMBER 4

METHODS OF Rh STUDIES IN A PRIVATE HOSPITAL BLOOD BANK*

By SISTER M. VICTORINE LONG
St. Mary's Hospital, Minneapolis, Minnesota

Most of the literature on the Rh factor deals with the principles of Rh sensitization and the clinical manifestation of this phenomenon. The purpose of this paper is to present the technical methods which can be used by the laboratory workers in an average sized private hospital.

The selection of good diagnostic Rh serum is of extreme importance. Rh serum can be obtained from various sources. The demand is very great and the supply is rather limited. In our experience commercial serum is frequently of a low titer by the time it reaches our hands. Several varieties have titers as low as 1-4. Rh sera deteriorates very decidedly, and probably the time lost in shipping and in handling by the supply houses is a factor which causes the poor quality of many of the diagnostic sera.

At the present time we prefer to use powdered serum which can be restored to the liquid state as it is needed. One c.c. is made up at a time and is dated. It should not be used longer than one month. In small hospitals it would be advisable to divide the one c.c. lot in half, and freeze one portion while the other

*First Award Paper, June 1946.
Read before A.S.M.T. Convention.

is being used. A score card should be kept on each serum, recording the negative and positive reactions. If the particular strain does not give 85 per cent positive reactions it should not be used.

Many of the difficulties in Rh studies result from using low titer serum. Technicians who have not had too much experience in Rh testing tend to get too high a percentage of Rh positive reactions with these poor sera. These low titer sera give such a faint reaction with Rh positive blood that it is difficult to distinguish a positive reaction from rouleaux, which may form with Rh negative blood. Our greatest need today in dealing with Rh sensitization is a good reliable diagnostic serum.

The technique of carrying out Rh testing in our hospital has changed considerably in the past few years. Originally we followed a modification of the technique described by Levine (5) in which one drop of Rh serum was mixed with one drop of the cells suspended in saline. The tube was incubated for one hour, then centrifuged and examined for clumping. This one hour wait was very objectionable. In case of emergency transfusion the wait was almost prohibitive. One hour in the middle of the night seems endless. In addition, the weak reactions obtained with some strains of sera were very disappointing.

Soon after we began to work with the Rh factor, one of the technicians in our city attempted to do Rh grouping on a slide similar to the method used for A and G grouping. The trial was so successful that we now do most of our Rh grouping in this manner. A drop of Rh serum is placed on a slide. This drop is deeply stained with the test cells directly from a finger prick or from a blood clot, using an applicator stick or tooth pick to incorporate the cells. A saline suspension must not be used. The drop is not spread out because a larger surface gives more drying and increases rouleaux formation. The slide is allowed to stand four minutes at room temperature, or in an incubator, if the room is cold. The slide is then rotated to re-suspend the cells and is examined microscopically. If the result is indefinite it should be repeated with a freshly prepared serum. If the doubtful result is due to rouleaux formation, the test should be set up in a test tube using one drop of Rh serum and adding cells until the drop is deeply stained. Let the tube stand about thirty minutes, then

centrifuge and examine microscopically. Sera which do not give clear cut positive and negative reactions by this method, are not reliable, and should be discarded.

An explanation for the good results obtained by this method is found in the work of Diamond and Abelson. (1) After the discovery of Rh "blocking" Antibodies by Race (2) and Wiener (3) Diamond and Abelson found that by using whole blood rather than a saline suspension of cells in testing, they were able to demonstrate agglutinins in nearly all cases in which sensitization was later proven, either by a transfusion reaction or by the delivery of an erythroblastotic baby. By Levine's method of testing in which saline suspended red cells are incubated with the test serum for one hour, antibodies are demonstrated in only 50 per cent of the cases of Rh sensitization (4).

Diamond concluded that the plasma provided a medium in which agglutination is accentuated. He also showed that these results are dependent on the viscosity of the media, and the greatest amount of agglutination occurs when the cells are suspended in 20 per cent albumin, and results almost as good can be obtained by using whole blood.

Thus, by avoiding the use of saline suspensions and by using whole blood or cells suspended in their own serum or in 20 per cent albumin, the activity of Rh agglutinins is greatly accentuated. Moreover, many sera which show no agglutination with cells in a saline suspension, show marked agglutination when suspended in a viscid substance. In our bank it is not practical to make up cells suspensions in 20 per cent albumin. However, it is very easy to use the cells suspended in serum. A sample of blood from each donor is kept in a small test tube. The blood is clotted, and by the time it is used the clot has retracted, leaving clear serum with a sediment of free red cells. When using the cells for cross-matching for transfusions, or in testing the sera of Rh negative women for sensitization, the tube is inverted once or twice and a small drop of this mixture of cells suspended in their own serum is pipetted into a test tube or on a slide. A full drop of the recipient's serum is added. The mixture in either the test tube or on the slide is left to stand for twenty minutes, then agitated and read microscopically. If a slide is used it is rotated to resuspend

the cells and is then examined. If a test tube is used it should be centrifuged at low speed before examining for agglutination. We consider the test tube method to be more reliable because there is less rouleaux formation.

Recently, we had occasion to demonstrate the effectiveness of this type of crossmatching. Because of the shortage of Rh negative blood in our bank on this particular day, we had hoped to give Rh positive blood to a 79-year-old Rh negative woman. The crossmatching done as described above, showed distinct agglutination. Subsequent study showed that her serum agglutinated all Rh positive cells, but did not agglutinate Rh negative cells. An investigation of her history revealed that she had had fifteen pregnancies, ten of which had resulted in death of the child. The last pregnancy dated back more than thirty years.

In doing Rh studies one will repeatedly encounter technical difficulties similar to those found in other blood bank work. Rh negative persons may agglutinate Rh negative homologous cells due to excess viscosity of their own sera. In like manner Rh negative persons may have cold agglutinins. Another factor which is of distinct importance in Rh testing is the "T" phenomenon. Our blood bank is often called upon to do Rh studies for nearby hospitals. The bloods for testing are shipped by mail, and often several days elapse between the collection of the blood and the time of testing. If it has not been kept sterile, bacterial deterioration will have begun, and the cells may then show the "T" type or panagglutinability. A typical example of "T" agglutination can be seen in the following: we received a blood sample from one of our doctors which he had carried in his pocket for several days. When grouped, it appeared to be a group AB Rh positive, but when we checked the serum with A and B cells we found that the serum behaved as a group A. We knew then that we were dealing with cells which were agglutinable by all sera, and concluded that the Rh was also not reliable.

All of these extraneous forms of agglutination must be kept in mind. We have made it a rule in our blood bank that when a serum gives unexpected agglutination, we match the serum against its own cells. Auto-agglutination is the key signal to all of these a typical agglutinations.

It should be the aim of each hospital laboratory to produce its own diagnostic Rh serum. The cost of commercial serum is considerable, and because of the great demand, it is sometimes difficult to get, and is of a low titer. The sera which may be encountered by interested laboratory workers, may have titers as high as 1-5000. When one can use such high titered serum, Rh testing truly becomes a pleasure. The blood bank workers should be greatly interested in carrying out prepartum and postpartum Rh studies for the obstetrical service. A complete discussion of the methods for such studies cannot be given here, but they are quite obvious. Rh grouping, checking the serum for agglutinins, and titration of the level of these agglutinins, are simply an application of the methods already discussed.

An Rh grouping should be done and if the patient is found to be Rh negative, the serum should be checked for Rh agglutinins. The serum is set up with seven or eight cells of a homologous group, either in a test tube or on open slide, according to the methods already discussed. If agglutinins are present, the titer should be determined. Two series of dilutions of the serum should be prepared, ranging from 1-2 to 1-1000, or higher. In one series saline is used as a diluent, and in the other plasma is used. The dilutions are prepared just as one prepares dilutions for other agglutinin titration. One drop of a heavy cell suspension of the blood which showed the best agglutination in the first testing, is added to each tube. The tubes are left standing thirty minutes at room temperature or in an incubator if the room is cold. They are then examined to see at which dilution agglutination no longer occurs. The series diluted with plasma will almost always show a much higher titer than the one diluted with saline.

During the course of these studies, women will be encountered who have potent agglutinins in their sera. The titer of agglutinins reaches its peak eight to fifteen days after delivery. These women will generally be very willing to donate three to five hundred c.c. of blood. It has been our policy not to offer money. In our experience more blood will be obtained as a voluntary donation than as a purchase.

After a blood with a high titer has been obtained, certain precautions must be followed. First the specificity of the serum must

be determined. About 200 tests should be made and a record of the results should be kept. Unless the serum gives 85 per cent positive reactions it should not be used for routine work. A 70 per cent serum could be used, but all the negatives obtained with this serum must be chceked with a serum giving 85 per cent positive reactions. When a suitable serum is found, it should be divided into 5 c.c. lots and frozen in a deep freeze unit. One ampule should be opened at a time. If the serum is of a very high titer, it may be diluted before using. The dilution should be such, that the finished product still gives sharp, complete agglutination on an open slide, in two minutes. The following is of tremendous importance: the dilution must be made with homologous plasma or serum, and never with saline. If it is diluted with saline, the viscosity is decreased, and the avidity of the serum greatly reduced. Finally, the ampules should be clearly labeled with the proper A and B grouping. Group O serum can be used only for Group O blood. Group A serum can be used for Group A and O blood and so on.

For the past several years, fortunately, we have been able to keep on hand potent Group AB serum. This serum can, of course, be used for any type blood. Previous to this we used other group sera which had to be neutralized with Witebsky's A and B substance. This was available from the Lilly Research Department only in the liquid form, and was not entirely satisfactory. The water base changes the serum viscosity and reduces the activity. Moreover, the antibody was poorly neutralized and the product had to be continuously checked against Rh negative B blood. Finally, the neutralization was not permanent. After several days the bond apparently broke down, and the A and B again became active. The Witebsky A and B substance in powdered form added in great excess may solve these difficulties.

As a form of summary, I will present the routine work in our blood bank. We do Rh tests on all recipients and all donors. The tests are done on an open slide and are read in about four minutes. Our Rh serum came from a lady on a farm in the wheat country of Minnesota. Her doctor had sent some blood to us for Rh testing because her baby had erythroblastosis. Her serum showed an Rh agglutinin titer of 1-2000, and was group AB. She readily donated 350 c.c. of blood. We parcelled the serum into lots of

5 c.c. each, and kept it in a deep freeze unit. Before using, we dilute it ten times with Group AB serum, and this diluted product gives strong reactions on a slide in two minutes.

We have discarded saline suspensions of red cells, entirely. All Rh studies, all Rh tests, all crossmatchings, and all prenatal Rh studies on pregnant women are done with red cells suspended in their own sera. Actually this is not an additional complexity but a simplification. A drop of serum is put on a slide or into a test tube and whole blood from a finger puncture, or from a blood clot, well incorporated, using an applicator stick.

We use Rh negative blood for all Rh negative recipients whenever possible. If we are short on negative blood, and are unable to borrow from a neighboring hospital, we may give Rh positive blood to an Rh negative man, or an elderly woman, who presumably will not require subsequent transfusions. Under no elective condition will Rh positive blood be given to an Rh negative female infant, to girls, or to young women.

In conclusion, I wish to express my appreciation to Dr. R. W. Koucky, our pathologist at St. Mary's Hospital in Minneapolis. for the help he has given me in preparing this paper.

BIBLIOGRAPHY

1. Diamond, Louis K., and Abelson, Neva M.: The Demonstration of Anti-Rh Agglutinins—An Accurate and Rapid Slide Test. Jour. Lab. and Clin. Med. 30:204, 1945.
2. Race, R. R.: Incomplete Antibody in Human Serum Nature, 153:771, 1944.
3. Wiener, A. S.: A New Test (Blocking Test) for Rh Sensitization, Proc. Soc. Exp. Biol. and Med., 56:173, 1944.
4. Diamond, Louis K., and Denton, Ronald L.: Rh Agglutination in Various Media with Particular Reference to the Value of Albumin, Jour. Lab. and Clin. Med., 30:821, 1945.
5. Schiff, Fritz, and Boyd, William C.: Blood Grouping Technic, 1942 Interscience Publishers Inc., 215 4th Ave., N. Y., page 69.
6. Fisk, R. T., and Marrow, Pl.: Occurrence of Anti-Rh Blocking Antibody in Anti-Rh Serum, Proc. Soc. Exper. Biol. and Med., 58:72-73, Jan., 1945.
7. Strandskov, H. H.: Rh Factor, New Inherited Human Variation, Scient. Monthly 60:451-454, June, 1945.
8. Mourant, A. E.: Rh Factor, New Antibody Nature, London 155:542, May 5, 1945.
9. Murray, J.: Rh Factor, Nomenclature of Subgroups Nature, London 154: 701-702, Dec. 2, 1944.
10. Tisdall, L. H., and Garland, D. M.: Large Scale Testing for Rh Negative Blood, J. Am. M. Ass., 129:1079, 1945.
11. Levine, Phelip, and Waller, R. K.: Erythroblastosis Fetalis in the First Born, Blood the J. of Hemat., 1:143, 1946.
12. Wiener, Alexander S.: Rh Factor in Clinical Medicine, J. of Lab. and Clin. Med. 30:957, 1945.

THE FUTURE OF MEDICAL TECHNOLOGY *

(As seen by a Clinical Pathologist)

By KANO IKEDA, M.D.
St. Paul, Minnesota

The writer is solely responsible for the ideas and sentiments expressed in this paper—K.I.

There is no future without the past. In order to discuss the problems of the future intelligently, the accomplishments of the past may well be considered first. Therefore, to appreciate what may be in store for the future of medical technology, it seems logical to dwell briefly upon the record of what has been attempted and accomplished during the earlier years. Hence, the introductory portion of this paper will be largely devoted to the accounting of what was actually done during the initial phase of the relations between the clinical pathologist and the medical technologist; thereby, I believe, more intelligent appreciation of the future of medical technology may be obtained.

It was not until after the first World War that the practice of clinical pathology became a medical specialty, dealing, more and more, with complex diagnostic laboratory procedures which represent the practical applications of basic medical sciences. Routinely employed to a limited extent, up to that time, in teaching or research laboratories under their respective specialists, many of these procedures had not been in use in the average clinical laboratory under the supervision of a single specialist—the clinical pathologist.

*Presented at the annual convention of the American Society of Medical Technologists, held at San Francisco, June 25-27, 1946.

The Wassermann reaction, the methods in blood chemistry, the basal metabolic rate determination, and other newer methods of laboratory diagnosis had just been introduced as routine laboratory procedures. Whereas, in those days, the clinical pathologist himself performed many of the laboratory tests, and his technician was usually a privately trained routine helper, often without the necessary educational background, and whereas the actual role of the clinical pathologist was frequently assumed by the internist, and the pathological anatomist was accustomed to look down upon the clinical pathologist as the "laboratory man" or the "supertechnician" who should not be accorded the dignity of a medical specialist, the practice of clinical pathology, as a specialty in medicine was slowly being recognized by the medical profession. In this, the surgeon and not the internist, seemed to have led the way. For the American College of Surgeons initiated a program of the standardization of hospitals which has exerted a far-reaching influence, not only upon the practice of surgery, but upon the medical practice in general and the practice of clinical pathology in particular. The dawn of a new era in the practice of clinical pathology had arrived. For the first time, the clinical pathologist, conscious of his place in the practice of medicine, had found himself a medical specialist. It was logical that the physicians engaged in the practice of this specialty should gather their forces and form a national organization of their own to promote and safeguard their professional interests. Thus, the American Society of Clinical Pathologists came into existence in 1922.

The new organization immediately encountered many problems vitally affecting the practice of clinical pathology. Not the least of these was the status of the laboratory technician and her place in the practice of medicine and her relation to the clinical pathologist. These had never been clearly defined and immediately became a source of concern and irritation to the practicing clinical pathologist, who was obliged to seek steps to remedy the situation for no other reason than to preserve his own practice.

About this time, several articles dealing with the training of technicians and their qualifications appeared in the current medical literature. The authors all agreed that there should be a

standardized course of training and the minimum educational and technical qualifications for technicians. Some advocated their registration or licensure either by a state board or by a national agency.

Commenting on some of these articles, the late Dr. H. E. Robertson wrote an editorial in the June, 1923, issue of Minnesota Medicine, entitled, "Education of Laboratory Technicians," which contained the following sentence: "We may look forward hopefully to the time when the coordinated efforts of the members of the medical profession which they (technicians) serve, will lead to more uniform standards of education and more clearly distinguishing criteria of individual fitness." Coming from a teacher of morbid anatomy, this pronouncement was indeed significant.

During the 1926 meeting of the American Society of Clinical Pathologists, the question of registration of laboratory technicians was openly discussed. A committee of four members was appointed, who devoted much of their time and effort in this task during the subsequent twelve months. The result was the first draft of the rules and regulations of the Registry of Technicians. This was presented at the annual meeting of the Society the following year. The recommendations of the committee, together with certain suggestions from the Executive Committee of the Society, were approved. The report of the committee stated in part: "We recommend to the Society the creation of a Board of Registry of medical technologists, laboratory technicians, and assistants under its direct control which shall embrace for its objectives, such functions as the establishment of the minimum standards of educational and technical qualifications for these laboratory workers, their classification and registration, registration of the schools offering a course of training for laboratory technicians, the maintenance of a placement bureau for registered technicians and several other considerations of pertinent importance to the practice of clinical pathology. In proposing the creation of such a board, we are actuated by a desire to place these various functions under a centralized agency, maintained and directed by our Society. We believe that in a plan such as here proposed, the medical profession may find a way to the practical

solution of the difficult problems attendant with the training and employment of the laboratory workers."

Then followed another year of intensive study and investigation, which included an analysis of the data contained in the first 350 applications for registration during the preceding year, the result of which would be interesting and illuminating when compared with that of the similar data of today; a study of curricula in medical technology then being offered by a few medical schools and universities, to formulate our own minimum standards of requirements in didactic work and practical training; an attempt to classify technicians according to their education, training, and experience; an investigation of the existing methods of training technicians by schools, the hospitals, Board of Health, and private laboratories.

The report of the committee containing these data was accepted by the Society which authorized the establishment of a Board of Registry of Laboratory Technicians and officially indorsed its function as outlined in the recommendations of the committee.

This, in brief, constitutes the history of the inception of the Board of Registry of the American Society of Clinical Pathologists.

Thus, the Registry of Medical Technologists was created, primarily as a measure of self-protection on the part of the clinical pathologist, through a system of regulation and control which was considered essential by the American Society of Clinical Pathologists, to meet the chaotic situation then prevailing among the laboratory workers, and as an authoritative agency of the Society to standardize and maintain the qualifications of these workers.

It should be recorded here that this was brought about in spite of the powerful opposition of not a few influential men including deans of several medical schools, professors of pathology and of medicine, and practicing clinical pathologists, who expressed a fear that, to demand higher educational qualifications in the laboratory technician would not only be an economic blunder from the standpoint of laboratory service, but, of a more serious consequence, would mean the creation of a class of workers who may eventually assume the role of a clinical pathologist by reason of their superior education and training. However, the record of

the years that followed has proven beyond any shadow of a doubt, that the fear, thus entertained by these well meaning medical leaders, has never materialized. On the contrary, we have been able to claim a substantial degree of success in all of the objectives for which the Registry was created.

With the efficient functioning of the Registry, the professional prestige of the registered medical technologist has been steadily improved, through the gradual elevation of the educational requirements, the establishment of the minimum requirements for the approved training school, and the cooperative program with the American Society of Medical Technologists. While the war has retarded the progress of the scheduled program of the Registry, the Board has constantly endeavored to maintain the high professional standards of the medical technologist and do what it could, under the trying circumstances, to improve her economic and technical status.

Recognizing the far-reaching influence which the organized medical technologists must eventually wield among the thousands of their co-workers, both within and without the Registry, the constitution of the American Society of Clinical Pathologists was amended, several years ago, to allow the registered medical technologist to be represented on the Board of Registry, not as a bona fide member, which might be interpreted as unconstitutional, but as an Advisory Committee to the Board. This was another step forward in the right direction. It was suggested that the Advisory Committee might eventually be chosen entirely from the members of the American Society of Medical Technologists, which the American Society of Clinical Pathologists might receognize as the organization officially representing all of the registered medical technologists. This I am confident, would be done when the membership of the society reaches the size equal to, say, 75 per cent or more of active registered medical technologists.

This leads to the discussion of the future of medical technology.

Just when medical technology came into being as a profession, no one seems able to state definitely. It is my opinion that it followed the adoption of a class of medical technologists by the Committee on Registration of Technicians in 1927 which considered a suitable designation to college trained technicians of exceptional

qualifications. In the beginning, a medical technologist was elected annually by the Board of Registry on her exceptional merits, in addition to her usual college degree. Thus, through common usage and understanding, medical technology became a profession composed of qualified medical technologists.

With advances in laboratory medicine and clinical pathology, such as we have witnessed in the past two decades, and with the full recognition of the role the medical technologist has played, medical technology may have eventually made its professional appearance, spontaneously, or by the efforts of the laboratory technicians themselves. There is no denying of the fact, however, that its inception and development have been substantially hastened by the pioneering work of the committee and the unfaltering leadership of the Board of Registry.

The providence had decreed, it seems, that the clinical pathologist should bear the child, nurse her, care for her and safeguard her health and well-being, and perhaps give her the education and training, until such time as she might, of her own free will, depart to seek and mould her destiny. Such time seems to be near at hand, when the clinical pathologist must recognize in her the capacity to determine her own professional conduct.

Indeed, I have long entertained a hope that, in the not distant future, the Board of Registry may be made an independent agency, which might be maintained jointly by the clinical pathologist and the medical technologist, so that the latter might be given a larger share in the direct control of her own professional destiny.

Such a hope could only be realized when the capacity of the medical technologist to assume her full professional responsibility should be demonstrated to the satisfaction, not only to herself, but to the clinical pathologist. And this could be brought about through the further development of the professional consciousness which shall not only prompt all like-minded medical technologists to unite into an all inclusive, representative organization such as your own, but demonstrate, in a concrete manner, their strength and determination by a substantial increase in your membership, so that the Society may truly represent all of the registered medical technologists. When this is accomplished, we may confidently look forward to the establishment of a new Board of

Registry, jointly operated by the American Society of Clinical Pathologists and the American Society of Medical Technologists. The function of such a Board may be detailed in a future communication.

With a membership of more than 75 per cent of active registered medical technologists, and with the prestige and influence such an organization must necessarily exert, there shall be every assurance of, not only carrying out the program of the Registry more effectively, but of dealing with a number of major considerations in which the medical technologist is vitally interested. These may now be briefly discussed, believing that the future of medical technology will largely depend upon how wisely the medical technologist may deal with them.

1. It is generally agreed among those interested in the future of medical technology, that the present minimum educational standards required of the registered medical technologist should not only be rigidly maintained, but be elevated to the level of college graduation.

2. Furthermore, to meet the increasing demand for highly scientific and technical procedures employed in modern medical diagnosis and research, the medical technologist with special aptitude should be encouraged to spend one or more additional postgraduate years to specialize in one of the several major branches of medical technology and devote her time in that specialty. (A paper on this subject was read by me before the National Society two years ago.) The experiences of recent years have doubly strengthened my convictions on the indispensability of the specialized medical technologist.

3. There is the question of what our attitude should be toward those valuable technicians who have not met or are unable to meet the educational requirements of the Registry. Shall we continue to maintain an attitude of indifference toward them, or shall we extend to them a recognition as a class of workers, whose place in routine laboratory service seems to be firmly established? There are those who sincerely believe that to recognize them as a class would be, in effect, equivalent to lowering the present standards required by the Registry. I contend that to extend recognition to them as a class, clearly defined as one below

that of the medical technologist, under a system of certification by a central agency such as the Registry, may aid in controlling their practice and keeping them aligned with the program of the Registry. Without such recognition and certification which shall clearly define their status, they may be encouraged and are actually being permitted to seek employment as qualified medical technologists, which may result in the false sense of security on the part of the ill-informed employer or in the actual deterioration of laboratory service. It is my personal opinion that such recognition should be extended to these technicians in order that the status of the registered medical technologist may be strengthened.

4. Legal licensure of laboratory technicians by the state is being debated. The Board of Registry and the Executive Committee of the American Society of Clinical Pathologists have indicated their opposition to the statutory control of laboratory technicians, on the ground that to do so would mean to lower the professional standards, to duplicate time and efforts, to encourage political manipulations and to generally create confusion. The idea is being championed by a group of technicians and their supporters who would minimize the past accomplishments and future program of the Registry. The medical technologist is vitally and directly concerned with this important question, and she should be prepared to settle it, in accordance with her own judgment tempered with the advice and wishes of the clinical pathologist.

5. The attitude toward the so-called "commercial" schools and the schools unapproved by the American Medical Association, must not be that of compromise. We should continue to point out, if any, the inadequate instruction given and the unethical or undesirable practices employed by such schools and insist on their remedy. Nevertheless, the graduates from such schools should not be unduly penalized. They are usually the victims of their own ignorance and poor counsel. The means should be found, not only to accept them on the terms which shall not compromise the Registry's minimum standards, but to afford them an opportunity to provide further instruction and training and to extend to them the privileges of the Registry, when possible.

6. At present, there is no adequate safeguard for the economic status of the medical technologist. There is wide discrepancy in her salary scale and working hours, not only in the different sec-

tions of the country, but within the same city or state. The clinical pathologist, himself often an employee, has championed the cause of higher salary and better working hours for the medical technologist. This alone does not seem to be sufficient to bring about the desired results. It should be supplemented by the organized efforts of the registered medical technologist. A commission may be created to study thoroughly this problem from all angles to formulate a policy which may guide you in your struggle against the economic injustices.

7. The registered medical technologist should assume the sponsorship of the postgraduate or refresher courses of instruction in various departments of medical technology. Too much dependence should no longer be placed on the outside agencies. In the past, the Registry has attempted, with some success, to aid in these endeavors and will continue to lend its full support in the future. The real progress however, shall come only with the awakening of the medical technologist herself on the value and need of such a program.

8. The publication of a professional journal devoted to medical technology which shall enjoy national recognition may well be undertaken by the medical technologist. There is a definite place for such a journal among the scientific publications in America. It means a substantial improvement on your present publication.

9. Operation of an employment agency for the benefit and convenience of the member technologists.

10. Perhaps the most important step to be taken would be the immediate employment of a full time executive officer who shall devote all of his time to build up a strong self-sustaining organization capable of realizing all of the objectives herein suggested, and to provide him with a national headquarters, where the business of the Society may be centralized.

These are some of the more pertinent considerations of immediate concern which are, I am sure, appreciated by every thinking medical technologist and require no undue emphasis. Serious consideration of these and other suggestions in order to translate them into concrete action by your Society seems imperative, if medical technology is to survive as a strong independent profession.

To summarize, a brief account of how the Registry of Medical Technologists was created by the American Society of Clinical Pathologists is related. During the eighteen years, since the beginning of its operation, medical technology gradually came into being as a scientific profession. Under the guidance of the Registry, as well as by her own efforts, the registered medical technologist has steadily improved her place in the practice of clinical pathology. With the improvement in her status, she should be accorded the right to determine her own destiny, always under the sympathetic guidance of the clinical pathologist. It is therefore hoped that a way may soon be provided, whereby the medical technologist may be given the equal voice in the conduct of the Registry. This should be contingent, however, upon the satisfactory growth of the present American Society of Medical Technologists, with a membership of not less than 75 per cent active registered medical technologists. Several major considerations of pertinent importance to the medical technologist are enumerated and briefly discussed.

I have taken you in confidence in presenting here my personal views on the vital problems which face the future of medical technology. By this, I do not wish to imply that the medical technologist is yet too immature or too dependent to know and to appreciate her own professional problems or to successfully deal with them. On the contrary, having explained the reasons which prompted the clinical pathologist to take the initiative in the matter, I have attempted to point out a way by which the medical technologist may, in the future, more firmly grasp her own professional destiny and endeavor to undertake a larger share of responsibility in the solution of the many problems which confront her. The relationship which exists between the clinical pathologist and the medical technologist is so integrated and so interdependent in the practice of clinical pathology, that there shall never be a complete separation between the two professional groups. The future of medical technology, nevertheless, rests not with the clinical pathologist, but primarily with the medical technologist herself, whose aroused professional consciousness may not only mean better service to the practice of clinical pathology but supply the vision which shall spell professional independence and dignity.

SOME APPLICATIONS OF SEMI-MICRO CHEMISTRY TO ROUTINE URINALYSIS

By CLARA M. BECTON M.S., M.T. (ASCP), C.L.T.*
San Francisco, California

The examination of urine dates back to the ancients who recognized that patients suffering from various skin affections voided "honey urine" which attracted ants. Among the writings of Hippocrates and Galen accurate descriptions are found which show their remarkable knowledge upon this subject. For many years urinalysis was limited to appearance, odor, and taste, hence the expression "sweet sugar diabetes." In Shakespeare's time urinalysis was quite popular. His character, Sir John Falstoff, in King Henry IV, inquired of his page " . . . what says the doctor to my water?" to which the page replied, " . . . Sir, the water itself was a healthy water, but for the party who owned it, he might have more diseases than he knew for . . ." It was not until the advent of analytical organic chemistry and the perfection of the compound microscope that modern urinalysis became possible.

In the year 1649 Frederick Dekkars of Leyden, Holland, described the use of heat and acetic acid for the detection of albumin and in 1780 Francis Holm fermented diabetic urine with yeast. Thus the foundation for chemical analysis was laid and, through the years newer scientific knowledge and refinements have developed urinology into an exact science.

Great strides have been made in analytical chemical technology since 1923 when Pregl was awarded the Nobel prize for his work on organic micro-analyses. Special apparatus, reagents and techniques have evolved from the glamour stages of micro-analysis. It is now possible for the expert micro-analyst to detect accurately one-hundredth to one-thousandth microgram of a substance. In micro-chemistry the utmost manipulative skill is required; years of practice are needed for proficiency in this field. The real advantages of micro-chemistry are that it permits many analyses to be done which otherwise could not be done with expensive

* Read before A.S.M.T. Convention, June 1946

chemicals and rare elements, it offers unlimited opportunities for technological research, and it saves time and money by using small quantities of material.

As a measure to bridge the gap between macro and microchemistry, semi-micro analysis became a "must" in chemistry. During the past ten years many new editions have appeared upon the subject of semi-microanalysis and this fact alone confirms the increasing popularity of this branch of chemistry among schools, universities, and industry.

The most important demand made upon any analytical procedure is that it permits a practical, accurate, and rapid detection of small quantities of a substance. Also the test must be selective, sensitive, and specific. Apparatus must be designed for rapid handling. One must know in what dilution and/or concentration sensitivity and specificity are lost. In other words, what are the limitations of a procedure. This, of course, includes the stability of the reagents, and a knowledge of the conditions necessary for obtaining the optimum result.

Semi-microchemical procedures are particularly applicable to urinalysis because the standard procedures are selective and specific when adapted to the use of small quantities of both reagent and urine. No elaborate apparatus is required. It is now possible to perform a complete urinalysis on as little as fifteen milliliters and, when a hydrometer requiring only five or ten milliliters of urine is perfected, this smaller amount will be adequate for a complete urinalysis.

Before discussing semi-micro urinalysis, a few remarks about specimen containers are needed, because containers can provoke much wrath and indignation against the exasperating situations which arise from time to time in those laboratories doing a large volume of out patient urines. When patients decide that a *complete* urinalysis is indicated in their case, they will invariably choose the largest container available, increase their fluid intake as a measure to guarantee success in filling the container near to capacity, and then, they will bring this voluminous specimen to the laboratory. The result is that the urine table is mushroomed with half-gallon jugs, an occasional four pound coffee jar, quart-sized coffee jars, mason jars, wine, beer and milk

bottles which form a towering background for pepsi-cola, coca-cola, ginger-ale, sparkling water and whiskey bottles and, olive jars, smaller milk bottles, various sized mayonnaise, condiment, and pickle jars, in addition to cheese glasses, extract bottles, and the miscellaneous array of medicine and cosmetic jars and bottles of all sizes and shapes. In contrast there are those patients who appear, by their examples, to have a definite appreciation of micro-chemistry, especially in its application to urinalysis. These are they who put their urine specimens into the cute little one and two dram perfume bottles, or insulin, or a quarter-ounce nose-drop bottle, or perhaps some other half-ounce bottle. Interspersed with the above miscellany are those half-dozen urine specimens from the pediatrics ward in test-tubes which have been stuck in any container available to prevent their spilling, as well as the several dozen hospital urines in regular containers.

Such a conglomeration of bottles must be arranged in a manner which will permit a worker to proceed with the various tests without knocking these containers over and spilling their contents, or these specimens must be re-poured into more suitable containers. It is needless to state that this is a time-consuming chore.

To date there is no ideal urine specimen jar available for use by both the hospital and general public. The plastic and paper containers are not only too light, but they are also non-transparent. Therefore, it is proposed that a new urine specimen bottle be designed to be made from glass and provided with a tight fitting gum rubber cap especially patterned to prevent leakage. The capacity should not exceed two ounces nor be less than one ounce. A heavy bottom is essential, to prevent upsetting. The top should be large enough and the jar long enough to permit the introduction of a hydrometer in order that a specific gravity determination may be made without repouring the specimen. A specimen jar of this type would be a dual purpose one, it would serve as a uriometer jar for the laboratory, a test-tube for the pediatrics department, and a satisfactory non-leaking bottle for both the hospital and John Q. Public. By moulding a "fill to here" into the glass at the proper level, patients, nurses, and orderlies would become aware of the quantity of urine necessary for a complete routine examination.

The routine urine chemical examination consists of tests for reaction, and the detection of albumin, sugar, acetone, diacetic acid and, bile pigments. Any of the standard procedures can be scaled for use with semi-micro proportions without altering the required accuracy of the tests. Repeated comparative tests with macro and micro amounts using the same samples have always been in excellent agreement in the hands of the writer.

The following preparatory routine saves much time. Ninety place test-tube racks (AHT Co) for tubes not exceeding 13 mm in diameter are recommended for holding test-tubes which have previously been dosed with the necessary reagents prior to beginning a run of urines. The ordinary small Wassermann serum tube or the standard Kahn tube are excellent for use in this type of rack. The various tubes are prepared as follows: Enough Rothera's ammonium sulphate-sodium nitroprusside mixture is placed into each of 30 tubes to give a one-quarter inch layer in the bottom of the tubes. These tubes are placed in the two back rows in the rack. One-half milliter of any standard albumin reagent such as Robert's, Exton's, or 3 per cent sulphosalicylic acid is measured into thirty more tubes from a burette. These tubes are placed in the middle rows of the rack. One milliliter of Benedict's qualitative solution is measured into each of thirty more tubes and placed into the rack. After filling, each set of tubes is numbered from one to thirty and placed in numerical order. If over thirty urines are run per day an appropriate number of racks should be thus prepared.

Semi-micro-urinalysis is performed as follows:

1. Line urine specimens into a row.
2. Number each bottle and request slip.
3. Mix specimens, remove caps, and pour 7-8 ml of urine into a 13 x 100 mm tube numbered with its corresponding specimen number and centrifuge at approximately 1500 rpm for 5-10 minutes.
4. Determine specific gravity. By touching the tip of the hydrometer bulb to a strip of universal indicator paper placed on a paper towel, the reaction of the specimen can be determined.
5. Remove tubes from centrifuge and place in a rack in numerical order.

6. With a 2 ml medicine dropper, transfer exactly two drops of urine into the corresponding tube containing 1 ml of Benedict's solution. Squirt half of the remaining urine into the albumin tube and the other half into the acetone tube.
7. Rinse the dropper thoroughly and repeat step six until all urines are respectively transferred.
8. Transfer the sugar tubes to boiling water bath for five minutes.
9. Lift the rack containing the acetone tubes to a 45° angle with one hand and introduce concentrated ammonium hydroxide from a 250 ml glass stoppered dropping bottle carefully, so that a clear cut ring is formed.
10. Shake the albumin tubes as they are inspected for contact ring or cloudiness. If the reaction is doubtful, repeat, using the heat and actetic acid test. Very little trouble is encountered with Exton's reagent. Record results.
11. Inspect sugar tubes and record results.
12. Inspect acetone tubes and record results.
13. If acetone is present, a diacetic acid test is made by using one milliliter of urine and adding ten per cent ferric chloride from a dropping bottle until no more precipitate forms. A characteristic Bordeaux-red color develops in the presence of diacetic acid and certain drugs. If a positive reaction is obtained, the usual confirmatory test must be performed.
14. If bile pigments are present, a few drops of Obermyer's indican reagent added to one milliliter of urine will give a green color in the presence of bile. Also, a contact test made with a ten per cent alcoholic solution of iodine will give a play of colors at the zone of contact if bilirubin is present. This test is adaptable to one milliliter amounts.
15. If increased amounts of urobilinogen are suspected, an indicator test may be performed by placing one-half inch depth of urine into a 100 x 13 mm tube and diluting with water to within one inch of the top. This gives approximately a 1-20 dilution. By adding 3-5 drops of Ehrlich's aldehyde reagent, a cherry red color develops if pathological amounts are present. The regular Wallace and Diamond test should be made if the indicator test is moderately positive.

Discussion

Amounts of urine as small as 0.25 ml have been used for checking the specificity of these tests. So long as exact quantitation is maintained, the results with these reduced quantities are reliable. With quantities less than 0.5 ml the additional time required for measurement is not practical.

Sulphosalicylic acid is the test of choice for albumin since it does not give a precipitate with urates and resinous acids. Although heat and acetic acid is excellent in its specificity, the time required for this test is not always practical when large number of urines are tested.

Rothera's test is highly recommended for acetone tests because of its stability. Water decomposes sodium nitroprusside, and only fresh solutions will give accurate results. Rantzmann's test is also reliable when adapted to semi-micro proportions.

The Millard-Smith method for quantitative urine sugar determinations offers the advantage that the percentage of a reducing sugar present is read directly from the special pipettes. Only 1 mm of Benedict's quantitative solution is required in this test.

To date Gerhardt's ferric chloride test is as reliable as most of the more recently described tests.

Semi-micro urinalysis offers these advantages: 950 tests can be made from a liter of Benedict's instead of the usual 190; the use of one-half ml of sulphosalicylic acid offsets its high cost as a reagent; the price of 100 x 13 mm tubes is nominal—these tubes present no cleaning problems, nor are they awkward for handling. The time and labor saved in the preparation of reagents is obvious. The cost of chemicals is reduced five to ten fold.

If the micro-analyst could create the atomic bomb from a bit of uranium no larger than an ordinary pin head, surely it is not fantastic to adopt a semi-micro technic for routine urinalysis.

ARE WE AFRAID?

An Editorial

When you were a youngster, how much courage did it take for you to jump into the creek where the water was just a bit over your head? And to start to school? — that was something that made you feel "I'm just a beginner, with all those years ahead of me, to learn." And so it was when you spent your first day in the hospital laboratory where you were going to learn to be a medical technologist. Would you like it? Could you "take it?" Anything new attempted takes courage in some degree. To go on to better things, to build, to grow, one must dare to try that which is new to him.

But beside a certain amount of daring, there remains another impelling force, that of the thrill of traversing new roads, of seeing new faces, of accomplishing new ends, of learning something new. That is the way the newly appointed editor feels about her duties now. There is a certain amount of hesitation, of wondering how well she will be able to fulfil the trust your Board of Directors has placed in her. (I must learn to use the editorial "we").

When it became feasible to bring the publishing of our Journal South in order facilitate its mailing to the ever-changing addresses of our rapidly growing membership, and generally to give that membership better service from our Executive Office in Lafayette, Louisiana, Mr. John Conlin, who has served as Editor-in-Chief of the Journal for fourteen years, felt that he could no longer take care of the publication by "long distance." We tried to find some member of the ASMT who would be capable of continuing to stimulate and to guide the Journal and to make of it a representative of a fast growing and developing profession and organization. There were as many refusals and for as many reasons, as there were inquiries made. Finally, in desperation, "we" made up "our" mind that "we" would make a violent effort to carry out the wishes of the members of the Board of Directors if they were willing to take the chance.

So your new Editor-in-Chief of the American Journal of Medical Technology takes this opportunity of saying, "We shall do our best to make of the Journal a publication worthy of representing the profession of medical technology, always to print only that of which our profession may be proud, articles of sound scientific value, material which will be useful to us as medical technologists, and items which will help in the up-building of our organization. Constructive criticism will be appreciated. We are not afraid, but we do enter this field with humility, admitting its newness to us, but with a resolve to do our best, and a willingness to work hard at the job."

—Rose Matthaei.

Miss Margaret Zalesky, Houston, Texas; Miss Gladys Eckfeldt, Chicago, and Miss Cecilia Korteum, Chicago, assisted in the compilation of material for the July Journal.

The American Journal of Medical Technology in transition from one staff to another offers the thanks of the entire membership of the ASMT to these persons whose splendid untiring efforts have kept us in touch with what has happened in the field of our profession for the past several years. To Mr. John H. Conlin, editor of the Journal since its beginning, to Miss Gladys Eckfeldt, who has taken care of the sections on Abstracts and Book Reviews, and to Miss Cecilia Korteum, who has compiled the news of State and Local Societies, go our sincere appreciation for the work they have done.

Members of the new staff approved by the Board of Directors are Dr. A. H. Braden, M.D., of Houston, Texas; Miss Clara Becton, MT (ASCP), of San Francisco, California; Sister M. Alcium, OSB. of Duluth, Minnesota. Dr. Philip Hillkowitz remains on the staff as an Advisory Editor.

ABSTRACTS

STUDIES ON LIVER FUNCTION: II The Value of Laboratory Tests in The Prevention of Arsenical Toxicity with Report of Two Unusual Cases of Encephalopathy: E. Hinds and F. Kalz, *Am. Jr. Syph., Gon. and Ven. Dis.*, vol. 30 No. 1, January 1946 p. 70.

Previous publications have shown the need for discontinuing arsenic therapy when laboratory tests showed a reduced prothrombin concentration and an impaired liver function. This paper reports two fatal cases. One had had only one dose and the other three doses. The first case showed hepatic lesions characteristic of acute necrosis with the cerebral lesions of toxic arsenical encephalopathy. The second showed changes in the central nervous system characteristic of encephalopathy. Vitamin K, vitamin B complex, crude liver extract and methionine, ascorbic acid and thiamine hydrochloride appeared to have no protective value.

It would be better to abolish massive arsenotherapy.

THE SICKLING PHENOMENON AND ITS BEARING ON THE PROBLEM OF RED CELL STRUCTURE: E. Ponder, *Jr. Exp. Biol.*, vol. 21, Nos. 3 and 4, August 1945 p. 6.

A description is given of observations made on wet mounts prepared from blood from the arm vein of persons with sickle-cell anemia. Heparin is used as the anti-coagulant.

The red cell which ultimately undergoes sickling cannot at first be distinguished from the normal red cell. It is also a biconcave disc. As the oxygen tension falls due to the metabolism of the cells in the mount, the bizarre forms characteristic of sickle cells are seen to develop. When oxygenated plasma or saline are run into the wet preparation, the sickling reaction reverses. The tips of the sickle cell approach each other and fuse and the original discoidal shape is again assumed.

INFECTIOUS MONONUCLEOSIS COMPLICATING PREGNANCY: E. H. Ennis, *Am. Jr. Obstet. and Gyn.*, vol. 51 No. 4, April 1946 p. 565.

About two months before term this patient showed marked listlessness. As the RBC was 2,890,000 with Hgb. 53 per cent,

transfusion was given. Some improvement occurred but about six weeks later malaise and listlessness were marked and mental depression was becoming evident. Approximately two weeks later labor was induced. Four days later a diagnosis of infectious mononucleosis was made on the basis of clinical findings and differential count. Heterophile reaction was negative and did not become positive until 10 days later.

The child at the end of the first month showed an RBC of 1,920,000 with thirty per cent Hgb. Transfusion, as well as ferrous sulfate, iron cacodylate and reticulogen were administered. The child was doing well at three months.

There is a question as to the relationship of the infectious mononucleosis of the mother and the anemia of the child.

DETERMINATION OF POLYSACCHARIDE IN SERUM: F. B. Seibert and J. Atno *Jr. Biol. Chem.*, vol. 163 No. 2, May 1946 p. 511.

The total serum polysaccharide is determined by means of the carbazole reaction of Dische. The color obtained varies with the type of carbohydrate present. Various types of colorimeters may be used for comparison. Free glucose was determined by the Somogyi method.

Another method is described in which the polysaccharide is determined directly by precipitating it in alcohol, washing the precipitate, redissolving and then applying the carbazole technique.

The average serum concentration of polysaccharide observed was 102.2 mg. per cent. In the individuals observed the values remained fairly constant unless disease was present.

FILARIASIS IN THE SERVICEMAN RETROSPECT AND PROSPECT: Captain L. T. Coggeshall, M.C. USNR, *JAMA*, May 4, 1946.

This study was conducted on 2,595 cases at Klamath Falls, Oregon.

Wuchereria bancrofti is prevalent particularly in Samoan group of islands and in Africa. Sixty to seventy per cent of the popu-

lation are infected in these areas. Vectors are several species of mosquitoes which deposit larvae on the skin, larvae penetrate and form adult worms in the lymphatic system. Adults mature, gravid females deposit microfilariae that can be found in chylous urine, in lymph or in dilated vessels. Microfilariae reach the general circulation where they are available to the vector.

The disease gives mild systemic manifestation, mild leukocytosis, low grade temperature with malaise. Diagnosis: Absolute Diagnosis depends upon finding adult work in biopsy or microfilariae in concentrated blood samples. Finding them, however, is rare. Skin tests with antigens were eighty-five per cent positive. Palpable nodes were found to be of not diagnostic significance for they also occur in other conditions.

Adult worms cannot reproduce themselves in the human body. Repeated biopsies have shown existence of calcified or disintegrated adult worms. The infection is self limited.

Since there have been only twenty recorded cases where microfilariae were found in the circulation blood, the possibility that the returned service man be responsible for causing infection in the United States is almost nil for about fifteen microfilariae per drop of blood are required to be infective. Microfilariae in transfused blood are noninfective for they must pass through a vector for maturation and be reintroduced by the insect.

Filariasis was acquired by 10,431 Navy personnel in the South Pacific area. Over a period of seventeen months, 2,595 cases were observed at Klamath Falls, Oregon.

STERILE MILK FOR BACKGROUND IN CAPSULE STAINING: G. C. Weber, *Stain Tech.*, ovl. 21, No. 2, April 1946 p. 76.

One drop of sterile milk is placed on a clean, grease-free slide. A small amount of the culture to be tested is added and the slide is allowed to dry. It is covered with Maneval's Solution A for five minutes, washed off, blotted and dried. The staining solution also contains a fixative for the casein film.

UNCOMMON CLINICAL MANIFESTATIONS OF VIVAX MALARIA: Major Harry Most and Colonel Joseph M. Hayman Jr., Medical Corps, Army of the United States. *J.A.M.A.*, February 23, 1946, vol. 130, No. 8 p. 480.

Atypical symptoms of Vivax Malaria occur in people who have been overseas in endemic malarial areas and had taken suppressive medication. After discontinuing atabrine or quinacrine, those who have been infected with Plasmodium vivax will show clinical symptoms of active malaria within several weeks or months or even a year.

Patients with delayed Vivax Malaria have shown negative blood smears. Two daily smears were taken for two to five consecutive days before parasites could be found. It is suggested that unexplained fever in returned service men not be treated until diagnosis has been established.

A few cases of malarial attack may be preceded by several days of watery diarrhea. The white cell count in these cases is rarely elevated and blood smears usually contain parasites.

Chronic low grade infections in some individuals may show slight to moderate anemia, slight icterus, and enlargement of liver and/or spleen. The same symptoms are frequently caused by inadequate malarial therapy. Antimalarial therapy also causes a reticulocyte response.

Central nervous system symptoms in maleria occur more frequently in falciparum infections. In vivax infection with symptoms, the spinal fluid is normal, white cell count is low and blood smears contain parasites.

Respiratory symptoms especially during the winter months are common in vivax malaria. In malaria the temperature elevation is not sustained beyond a few hours after chill, X-ray of chest is negative, blood smear contains malarial parasites.

Years after cessation of malaria, reoccurrance may happen after trauma, anesthesia or surgery.

The authors emphasize the fact that especially in returned service personnel who never had malaria, who were in an em-

demic area, and who took suppressive medication may develop "delayed primary" malaria. Smears may be negative for several days. Carefully studied smears made repeatedly will be rewarded in many cases by a diagnosis of Plasmodium vivax.

THE SERUM AGGLUTINATION REACTION IN DIAGNOSIS OF BACILLARY DYSENTERY: Col. A. R. Thomas Jr., M.C. USA and Lt. Col. Max Levine, Sn.C. AUS., *Am. J. of Clin. Path.*, February 1946, vol 16, No. 2 p. 108.

The agglutination titers of serums from 534 service and civilian men and women (submitted for routine Kahn tests at a southern Army Camp) were tested against Shigella dysenteriae, S. ambigua, S. sonner, S. newcastle, and five races of S. paradysenteriae (V, W, X, Y, Z).

The frequency of positive findings among the serums tested were high. Serums from prenatal patients showed a higher percentage of positive agglutination, i.e.: a titer over 1:40 for S. dysenteriae, and 1:160 for S. paradysenteriae group which are considered of diagnostic significance in most literature.

It is emphasized that the serum reaction of patient against known antigen is unreliable and that actual isolation of the causative organism from the feces or from rectal swab is essential for diagnosis.

In cases of acute gastro-enteritis from which strains of S. paradysentariae were isolated, no correlation between the titer of patient's serum and the organism isolated from his stool was found. Cross agglutination occurred frequently and the highest titer of antisera agglutinating the isolated organism was considered diagnostic thus making a fixed titer of serum as diagnostic useless.

HYPERINSULINISM OF AN UNUSUAL TYPE: A METABOLIC STUDY: J. W. Conn, M. W. Johnston, E. S. Conn, *Ann. Int. Med.*, vol 24, No. 3, March 1946 p. 487.

The patient described was a young woman who had attacks of sudden unconsciousness at intervals of three to five weeks. Low blood sugars had been found but there was no history of convulsions, hunger was not a symptom and food did not abort attacks. Fasting blood sugars during a study made in a period when attacks were occurring showed values as low as 36 mgs. per cent. Administration of glucose afforded relief. Biopsy specimens of pancreatic tissue showed a slight intralobular fibrosis. Islets of Langerhans were normal. Attacks increased to almost daily. Intensive studies made at this time finally revealed that the patient had been taking insulin.

KLEBSIELLA (FRIEDLANDER'S BACILLUS) INFECTIONS IN AN ARMY HOSPITAL: Edward P. Swartz, Major, M.C. AUS, and Paul A. Rhode, Captain, Sn.C., AUS, *Am. Journal of Clin. Path.*, February 1946, vol. 16, No. 2 p. 88.

Contrary to the consensus that Klebsiella bacillus is found infrequently, these authors have found that Klebsiella infection in osteomyelitis occurred in 6.8 per cent of the cases in pure and mixed cultures. Technique consisted of taking material with a sterile applicator in surgery in each case of sequestrectomy. The applicator was placed on 0.5 c.c. of sterile brain heart infusion broth and taken to the laboratory immediately where cultures were planted on E.M.B. agar, Bacto Brain Heart Infusion Agar containing five per cent dehibrinated sheep's blood and 0.05 per cent chloral hydrate, and on Brewer Modified Media.

Klebsiella bacilli have been found responsible for 25 per cent of G. U. tract infection. This organism is highly virulent and the mortality is given as seventeen per cent. About twelve per cent of G. U. infections with Friedlander's bacillus develop into bacteremia.

It is not uncommon to find otitis media caused by Friedlander's bacillus. It is also said to be the primary cause of many infections of the biliary system.

Group A Klebsiella is more commonly found in human infections, and this is determined by the use of specific agglutinating serums.

Sulfadiazine is the most effective drug against the Klebsiella bacillus.

The authors emphasize the fact that Friedlander's bacillus is etiologic agent in diseases other than of respiratory system. It is the cause of only one per cent of pneumonias. Fermentation reactions vary greatly with this organism and positive identification has been difficult. Identification is made with specific typing serums of a Gram-negative encapsulated rod.

THE ACTION OF PENICILLIN ON SEVERAL GENERA OF THE ACTINOMYCETALES: C. H. Drake, *Jr. Bact.*, vol. 51, No. 2, Feb. 1946 p. 199.

Of seventeen strains of Streptomyces tested only eight were inhibited by concentrations of 1000 units per ml. Only three of these were completely inhibited.

The concentration of penicillin necessary to inhibit Nocardia asteroides was found to be much greater than could be attained in the body.

The two strains of Micromonospora tested showed slight inhibition.

THE EFFECTS OF THE TRANSFUSION OF GROUP O BLOOD OF HIGH ISO-AGGLUTININ TITER INTO RECIPIENTS OF OTHER BLOOD GROUPS: Major Leslie H. Tisdall, Captain Donald M. Garland, 1st Lt. Paul B. Szanto, 1st Lt. Albert M. Hand, and Captain John C. Bonnett, M.C. AUS, from the Army Whole Blood Procurement Service, New York, N. Y., *Am. Journal of Clinical Pathology*, March 1946.

Review of literature on the subject shows that a standardized technique for agglutinin titer should be adopted.

Thirty-nine volunteers of Groups A, B, and AB were given 250 c.c. of Group O plasma of varying isoagglutin titers, and the patients were observed for reactions, change in hemoglobin, red cell count, hematocrit, blood bilirubin, urobilinogen, and intravascular agglutination. It was found that the higher the incom-

patible isoagglutinin titer the more severe the post transfusion reactions ranging from urticaria to hemoglobinuria. It is concluded, therefore, that indiscriminate use of universal donors is to be condemned; that titers of 1:200 or less would have a negligible hemolytic reaction if any; and that had these transfusions of plasma been given to patients in shock or with serious depletion of blood volume instead of to healthy individuals, much more serious results would have been encountered.

The use of A and B substances to condition Group O plasma was found to reduce reactions in the few cases tested, but it required further study.

The value of having low isoagglutinin titered Group O, Rh negative blood for emergency use in a blood bank is emphasized.

LISTERELLA MENINGITIS: N. I. Handleman, M.D., C. C. Rotondo, M.D., E. P. Scott, M.C., and H. T. Knighton, D.D.S., *The Jr. of Pediatrics*, February 1946.

This is a report of a recovered case of meningitis in a six-weeks old child caused by Listerella monoctogenes. The organism is a rare pathogen in man but it is highly pathogenic for mice and guinea pigs. The Listerella organism is a small Gram-positive rod that grows readily on blood agar anaerobically. The organism's susceptibility to penicillin was found to be twenty times more resistant than Staphylococcus aureus strain.

THE ACTION OF PENICILLIN ON STAPHYLOCOCCUS: R. F. Parker and H. C. Marsh, *Jr. Bact.*, vol. 51, No. 2, February 1946 p. 181.

When low concentrations of penicillin are added to broth cultures of staphylococci an interval of unaffected growth ensues for the period of one full generation before death begins. This lag is not found when greater concentrations of penicillin are used. If the organisms are removed to a penicillin-free medium before the killing effect is established, the effect of the penicillin continues for some time. Staphylococci exposed to one unit penicillin per ml. of culture medium did not resume growth until three hours after removal from the penicillin medium.

MISS MARY EICHMAN,

PRESIDENT

AMERICAN SOCIETY

OF

MEDICAL TECHNOLOGISTS

As President of the Pennsylvania Society of Medical Technologists and Laboratory Technicians in 1942-43, Miss Mary Eichman may be given much credit for the continued growth and activity of that organization during the early war years when so many other societies were disbanding "for the duration." She has continued to take an active place in the Pennsylvania Society as a member of its Advisory Board. From July 1, 1942 through June 30, 1944, Mary served as Recording Secretary of our own organization. Those of you who became members during that time received letters from her welcoming you into our group. As President-elect for the past two years, Mary has proved herself a person on whom we can depend for wise and thoughtful guidance during the coming year. May we extend to her the co-operation of all our present membership and hope that before the end of her term of office, she will be the head of an organization with 7500 members.

NEWS AND ANNOUNCEMENTS

HIGHLIGHTS FROM THE ANNUAL CONVENTION OF THE ASMT AT SAN FRANCISCO, CALIFORNIA

JUNE 25, 26, 27, 1946

The fourteenth annual convention of the ASMT had a registration of approximately 10 per cent of the total membership. There were about 200 persons registered. The House of Delegates was attended by thirty-three delegates from seventeen states.

The Executive Secretary reported a membership total of nearly 2100, an increase of approximately 1400 since the last convention in 1944. Fifteen state societies renewed their charters while three organizations filed their applications for affiliation. The Advisory Committee reported that the Davidson County (Tenn.) Society of Medical Technologists and the Worcester District (Mass.) Medical Technologists Association applications were approved. The Counsellor from the North Central States submitted a report on the results of her efforts to assist in the organization of societies of each of the states in her district. Miss Claussen stated that North Dakota, with Sister M. Edeltrude, of St. John's Hospital, Fargo, will possibly make some effort to organize a state society this fall. South Dakota, with Mr. Harry Falconer, City Health Dept. Laboratory, Sioux Falls, sub-counsellor, has thirty-one registered M.T.s (ASCP) in the state. No definite plans for organization have been made. Miss Ruth Aufderheide, Mercy Hospital, Des Moines, Iowa, the sub-counsellor for that state, had replies from sixteen persons in response to her letters. These sixteen should form the nucleus for reorganizing their state society. Wisconsin has no sub-counsellor, but as there is already an active state society, with at least two city organizations affiliated with it, that state can be counted upon as an active member of our association. Minnesota, also was very active during the past year. The state is divided into five districts, each with a strongly organized city group. Their membership in the ASMT more than doubled during the past year.

The following were elected to the Board of Directors for the coming year: Mrs. Lucille Wallace, President-elect; Sr. M. Alcuin, reelected Corresponding Secretary; Miss Henrietta Lyle and Miss Rose Matthaei. Miss Cora Miller was elected to the Advisory Board. Miss Mary Eichman becomes President on July 1, 1946. Two vacancies on the Board of Counsellors occurred during the past year: namely, Miss Clara Becton left the Northwestern District, and Miss Esther Anderson of California was unable to accept her appointment. These places will be filled by appointments by Miss Eichman.

A report of the meeting of the Advisory Committee of Medical Technologists with the Board of Registry was made by Miss Eichman, Miss Tate, and Miss Matthaei.

The Advisory Board, with Miss Henrietta Lyle, chairman, Mr. L. O. Ray, and Mrs. Dorothy Meyer, together with Miss Mary Eichman, Mrs. Lucille Wallace, and Miss Matthaei, as ex-officio member, served as a committee to revise the Articles of Incorporation and By-laws during the past year. Miss Lyle submitted the following report: "We, the members appointed for the study of revision and structural changes of the Articles of Incorporation and By-laws, to make of the ASMT, in principle, an association of state organizations, wish to submit the following report: With legal guidance, the Articles of Incorporation have been more concisely arranged and the deleted material relegated to the by-laws in order to conform with the corporation laws of the state of Michigan (Michigan Law Digest)—in which state we are incorporated as a non-profit organization. The proposed changes of the Articles of Incorporation were mailed to the membership at large sixty days prior to the House of Delegates meeting of June 26, 1946, together with the declaration of intention to amend the by-laws. Since the proposed changes of the Articles of Incorporation have been received by the members of the ASMT, the committee members have received numerous suggestions regarding these changes. The most adverse criticism centered on Article VIII, Section 1. 'Membership'—'No person now a member in good standing with this corporation shall be disqualified or removed from membership by any provision of these articles or by any by-laws of the corporation now in effect.' Therefore, the

committee recommends that this section be amended to read as follows: 'Persons who hold certificates from and are in good standing with the Board of Registry of the ASCP and who otherwise meet the requirements of this corporation shall be eligible for active membership in this corporation.'

There were no suggestions to necessitate other changes in the Articles of Incorporation as submitted to the membership.

"Regarding the by-laws, the material deleted from the Articles of Incorporation was inserted in the proper place in the by-laws with slight changes in phraseology. This was done at the suggestion of our legal adviser to facilitate future changes in the by-laws when advisable, without making necessary any amendments to the Articles of Incorporation. This was also the opinion of Miss Bertha Esler, Director of the Michigan Corporation and Securities Commission.

"The committee has made no radical changes whatsoever in the by-laws of this corporation since we feel that this would require much more detailed discussion, suggestions, and opinions from the membership at large. Therefore, in line with this suggestion, and opinions by various members of the corporation, the committee wishes to make the following recommendations:

1. That the president appoint a committee for continued study of any proposed provisions deemed necessary by the membership.

2. To consider suggestions received by this committee too late to embody in the present revision, namely:

a. the possibility of having a Doctor of Science or someone other than a pathologist as one member of the Advisory Editorial Board of the Journal.
b. that a counsellor may be replaced at any time by the Board of Directors.
c. that provision be made for expulsion of any individual member for just cause.
d. that provision be made for a finance committee to prepare an annual budget for approval of the House of Delegates.
e. to provide in the by-laws for the qualifications and rules regulating classes of members other than active and honorary members.
f. that members in good standing with the corporation may

be permitted to sit in the gallery at the House of Delegates, but without the privilege of a vote.

g. that the editor of the AJMT be included as a member of the House of Delegates."

Respectfully submitted
Mary Eichman
Lucille Wallace
L. O. Ray
Dorothy Meyer
Henrietta Lyle, Chairman.

In acting upon the changes in the Articles of Incorporation, the address of the registered office of the ASMT in Michigan was changed to 1100 Dime Bldg., Detroit 26, Michigan. The proposed Article VIII, Membership was defeated, so that Article VIII, Membership, is retained as of the 1939 revision. Articles IX, X, XI, XII, and XIII, were accepted as revised. The By-laws were accepted as revised. The Board of Directors voted that each new member receive a copy of the Articles of Incorporation and by-laws as he receives his certificate of membership.

Miss Mollie Hill made a report of the meeting which she attended as the official representative of the ASMT at the Women's Bureau of the Department of Labor, last March. This meeting was of significance primarily in that the ASMT was recognized and requested to have a representative, rather than that the problems related to professional workers. However, Miss Hill also reported upon the recognition which is being accorded to the medical technologists by the Veterans Administration on the basis of high educational qualifications rather than on the basis of registration. Those specialists with degrees will be given professional status on the basis of education and experience.

Miss Esther Wilibrecht read the report of the Resolutions Committee to the effect that the officers, members of Boards, and Committees, who had served the organization be accorded thanks and commendation by the House of Delegates.

The following were elected to serve as Nominating Committee for the next year: Miss Grace Ballard, chairman; Miss Elizabeth O'Toole, and Miss Mollie Hill.

The Board of Directors recommended and the House of Delegates ratified the following: that "A sum of $600 shall be provided annually to be divided proportionately according to their distances from the annual meeting place between the following officers: President, President-elect, Recording Secretary, and Treasurer. Also a sum of $400 shall be provided annually to be divided proportionately according to their distances from the annual meeting place between the members of the Board of Directors exclusive of the officers. The share of any of these officers or board members not attending the annual meeting shall be returned to the treasury of the Society."

The Executive Secretary was empowered to purchase such office equipment as the executive office is in immediate need, namely, a mimeograph machine, typewriter, adding machine, and postal scales.

The following budget was submitted by the treasurer and accepted by the House of Delegates:

American Journal of Medical Technology—	
per capita for whole year members	$ 1.00
for one-half year members	.50
Executive Office expense	2700.00
Officers' Convention expense	600.00
Board of Dir. Convention expense	400.00
Executive Sec'y Convention expense	200.00
Office allowance for officers' expense (monthly)	5.00
Stamp fund	500.00
Printing	400.00
Addressograph	100.00
Treasurer's Bond	12.50
Committee Fund, etc.	900.00

The following report was submitted by the Education Committee: "During the last two years our group has had many problems. Our first and chief concern was the pressing problem of the returning service men and women. The pamphlet sent to all registered medical technologists explained our committee's organization. As Chairman of the committee, I received many letters from service men returning or from registered medical technologists concerning schools. In return I mailed the AMA

list of approved schools and the Registry booklet. We encouraged all these people not to listen to high pressure 'diploma mills.' We also gave personal interviews to many returned service people. We, as the educational committee, hope to avoid failures with returning service people by getting them properly trained.

"Our second step was launched by the Minnesota State Society in the paper writing contest (See notice elsewhere in this Journal regarding the second annual contest). This met active response only in the state of Minnesota. Other states did not respond.

"Our third step was the preparation of slides on various blood dyscrasias and certain parasitology slides. We have to date, about thirty loan sets on hematology. The parasitology sets are not completed but these will be ready for seminar use. We are also trying to encourage technologists to stimulate seminar courses in their various sections. We also have requests that the Abstracts appearing in our Journal be increased in number. Any technologist who is aware of teaching films or slides should notify his fellow technologists. As a committee we hope to be able to answer your questions along an educational line, and ask the membership to feel free to call upon us."

Rachel Lehman, Chairman
Sister M. Alcuin
Cora L. Miller

The Board of Directors concurred in the feeling that the loan sets should be dispensed through the Executive Office. A further announcement in this regard will be in the September Journal.

A letter was received from Miss Doris Spear, of Houston, Texas, in regard to honorary societies for medical technology students in the universities. This matter was assigned to the Education Committee with the recommendation that it be considered carefully and that such societies be advised to organize on the basis of high scholastic standing.

Dr. Robert S. Stone, Professor of Roentgenology, University of California, and one of the first scientists called for work with the "Manhattan Project," was the guest speaker at the banquet. Dr. Stone spoke on "Public Health Problems in the Development of Atomic Energy."

MEETING OF THE BOARD OF DIRECTORS AS OF JULY 1, 1946

June 27, 1946

At this, the meeting of the Board of Directors of the new fiscal term, Miss Mary Eichman presided. Other members present were Mrs. Lucille Wallace, Miss Loretta Laughlin, Sr. M. Alcuin, Miss Henrietta Lyle, and Miss Rose Matthaei. Miss Hermine Tate was also present. At this meeting a letter from Mr. John Conlin, the Editor of the AJMT, was read. Due to the fact that it has become feasible to publish the Journal elsewhere than in Detroit, Michigan, Mr. Conlin tendered his resignation as editor. Miss Rose Matthaei was appointed by the Board to serve as editor for a term of three years.

With the Board of Registry confirmation of the allowance of a third representative from the ASMT on the Advisory Committee, the president and president-elect were empowered to choose that third member as soon as they receive further information from the Board of Registry.

A revision of the "Information Pamphlet" was authorized, as well as the assembling of a brochure for distribution among high school and college students. This latter will contain information relative to the profession of medical technology and will be prepared under the auspices of the Education Committee.

The scientific and entertainment programs of the convention fulfilled all expectations, and those committees to whose efforts we owe so much are hereby duly recognized as being responsible for much of the success of our convention.

Last, but not least, for the first time in the history of our organization, the meeting place for our next annual convention can be announced at this stage of the game. Early in June, 1947, we shall convene in Denver, Colorado, the birthplace of the Registry, for our fifteenth annual convention.

REPORT OF THE MEETING OF THE ADVISORY COMMITTEE OF MEDICAL TECHNOLOGISTS WITH THE BOARD OF REGISTRY

JUNE 26, 1946

Miss Rose Matthaei and Miss Mary Eichman, representing the ASMT, and Miss Hermine Tate and Mrs. Caroline Herman, representing registered MTs (ASCP) at large, met with members of the Board of Registry, on June 26, 1946, immediately prior to the meeting of the House of Delegates.

The Board of Registry was requested to consider the feasibility of full representation of medical technologists on the Board. As this will not be possible of fulfillment before the matter goes through the official channels, which process takes a matter of at least two years, the Registry is making effective at its next annual meeting, the attendance at all sessions of two of the three representatives of the ASMT. Effective also at this time, is the allowance of three, rather than two, of the members of the Advisory Committee, to be members from the ASMT. With the increase of our membership to approximately seventy-five per cent of the active registrants, we shall gain more active representation on the Board of Registry.

Dr. F. B. Queen, representing the Board, and Miss Tate, representing medical technologists, were appointed by Dr. Montgomery to revise the Code of Ethics. Any suggestions in this regard will be received by Miss Tate at the Executive Office of the ASMT.

The Registry offered to assist us in contacting the new registrants in regard to membership in the ASMT, thus continuing their past policy of cooperation in encouraging enrolment in the national organization.

The examination for registration was also considered, and it seems that the "practical" portion will not be brought back into use. Instead, there is the possibility of using the true-false, multiple choice method of examining applicants, and having a few "technical" questions also.

The question of other classes of registrants, as well as other classes of members of the ASMT was discussed. In some parts of the country, it seems that there is the possibility that a reversion to the former classification of L.T.s and M.T.s by the Registry might be advisable, while on the other hand, a more liberal policy in regard to accepting those people with high educational qualifications and specialized experience seems to be the more likely trend. In regard to the former, would it be a wiser policy to certify that class of laboratory workers who do not qualify as medical technologists, and so bring them, in a manner of speaking, "into the fold," or would this policy signify to the uninitiated that the L.T. is as completely acceptable as the more highly trained M.T.? On the other hand, are we losing a valuable class of medical technologists by not accepting fully those people with college degrees, Doctors, as well as Masters and Bachelors, who have experience in a single field of medical technology? There was a decided difference of opinion on these questions among the Board of Registry members as well as among the Advisory Committee members. Please let us have your reactions.

The Registry will help defray the expenses of seminars instead of assisting individuals with post-graduate courses. This will have a much more far-reaching effect. The Education Committee of the ASMT will assist with the seminars in an advisory capacity, and the Executive Office of the ASMT will act as liaison office in contacting the Registry.

The matters of labor unions and state licensure were discussed. Those in attendance were unanimously opposed to a professional group giving the slightest consideration to the possibility of unionizing.

The Registry is anxious to discuss with us those problems which relate to medical technology. The explanation was made that the apparent slowness with which our questions are answered is due primarily to the fact that any change in policy must go through several agencies, in the A.M.A. as well as the A.S.C.P. For this reason, if you have any problems which should be considered, the sooner you present them to a member of the Advisory Committee, the sooner they will be presented before the proper authorities.

REPORT OF THE COMMITTEE ON AWARDS—1946

The following Awards were presented by the ASMT at the convention:

Scientific Papers

First Award: Gold Medal and $50 to Sister M. Victorine Long, St. Mary's Hospital, Minneapolis, Minnesota; Title of Paper: "Methods of Rh Studies in a Private Hospital Blood Bank."

Second Award: Silver Medal and $30 to Miss Helen Spicer Menkel, 3733 Sheridan Blvd., Denver 12, Colorado; Title of Paper: "Methods for Determining the Erythrocyte Count on the Photoelectric Colorimeter."

Third Award: Bronze Medal and $15 to Miss Elizabeth O'Toole, Department of Bacteriology, University of Colorado School of Medicine, Denver, Colorado; Title of Paper: "A Method for Testing the Sensitivity of Various Species of Bacteria to Penicillin, Streptomycin, and Sulfathiazole."

Special Award: Ten Dollars presented by Dr. Foord, Pasadena, California, and special mention as "very well written, practical, and fills a need in an untilled soil," Miss Rachel Lehman, Indiana University School of Medicine, Indianapolis, Indiana; Title of Paper: "Preparation and Presentation of Teaching Materials for Clinical Laboratory Demonstration."

Award for Scientific Exhibit: Minnesota Society of Medical Technologists, $50.

1946-47 COMMITTEES

Education Committee

Miss Rachel Lehman, Chairman, 3939 N. Capitol, Indianapolis, Indiana (Appointed 1945)
Sr. M. Alcuin Arens, OSB, College of St. Scholastica, Duluth 2, Minnesota (Appointed 1945)
Miss C. Louise Miller, 28 B. Elizabeth Road, Hampton, Va. (Appointed as of 1944)
Miss Esther McElwee, Charity Hospital Lab., New Orleans, La. (Appointed as of 1944)
Miss Kathryn Aderhold, State Dept. of Health, 3400 North Eastern, Oklahoma City 5, Okla. (Appointed 1946)
Miss Rose Hackman, Univ. of Colorado, 4200 East Ninth Ave., Denver 4, Colo. (Appointed 1946)

Nominating Committee

Miss Grace Ballard, Chairman, 925 No. 13th St., Milwaukee 3, Wisconsin
Miss Elizabeth O'Toole, 1345 Elati St., Denver, Colo.
Miss Mollie Hill, 2325 - 37th St., N.W., Washington 7, D. C.

PRESIDENT'S ADDRESS

THE AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
In Annual Convention Assembled at the Palace Hotel,
San Francisco, California, June 25-27, 1946

ROSE MATTHAEI, MT (ASCP)

Fellow Medical Technologists, Friends:

My report to you will be brief. The past two years have been filled with endeavor to cope with the development of the times rather than achievement of definite ends. Our hope is only that we shall grasp that opportunity which is ours to make of medical technology a true profession.

Our national organization is growing—has grown to three times its size in a short two years. That is not enough. We want every registered medical technologist a member of his national association through membership in local and state societies. And we want every medical technologist certified by the Board of Medical Technologists.

Developmental trends in our profession are now such that we are going to have to lay less stress on minimum requirements, or raise that minimum to a base commensurate with the innate qualities of the profession. We can no longer rely on the outworn excuse of "wartime" when we really mean "laziness" or lack of courage to forge ahead.

I hope that the Board of Registry will see fit at its present meeting to raise its minimum requirements for certification of medical technologists. Let a Bachelor's degree with the basic sciences be the minimum. Those four years are necessary if a would-be medical technologist is to have the well-rounded formal education he needs for his place in the professional world. One of the trends in medical technology is toward specialization. Let us hope that our Board of Registry will encourage the certification of more of our specialists in the branches of medical technology, that the requirements for these persons will be set even higher, both in regard to scientific education and experience than for the person who practices in the whole field.

May we continue to build toward strength by uniting all medical technologists in our own organizations, and not tear

down our professional standing by going to outside agencies for their help. We do not need the assistance of a John L. Lewis or an A. F. Whitney to gain the respect of ourselves or others. Our standing now is well on its way to becoming recognized as truly professional.

With the danger of being trite, may I ask here, if we do not feel toward medical technology, not that ours is just a job, to be considered merely from the viewpoint of wages and hours, nor even limit our viewpoint to that of a professional person to whom wages and hours become secondary as they become a matter of course in proportion to the amount of "self" that is thrown into his work—which leads to the highest relationship of a man or woman to his work, and makes of it a "calling"—his is indeed a part of himself—and medical technology is well on its way in the hearts of most of us to being a "calling" because it is verily something which cannot be thought of apart from the individuals who have chosen it?

Yet we must continue to be practical, "in unity there is strength," we still must strive for recognition, by the doctor as well as the layman. Let us so conduct ourselves and our work that the registered medical technologist who is a member of his professional organizations, will be the one chosen for employment.

Let us encourage all those with a desire to join our ranks to qualify educationally. It is in our hands to do (with) what we will. And we must not start at the top, as the individual is the unit from which we build, let us go into our cities and towns and work from the point of local or county organizations. Let us bring together the ten or twelve registered medical technologists there as a nucleus, with others, being those potential members who have chosen the same type of work and by so choosing, have signified their intention to grow with us. Those who have had a taste of medical technology while they were in the service are examples of the type of person who needs our help and proper guidance right now. They must be encouraged to choose the way, not of least resistance, but of the greatest accomplishment, that of qualifying first.

And that is our responsibility. Not one of us can feel our work is done when we leave the laboratory at the end of the day. Some-

times it might be just a word, but with our calling, and its being a part of us, by living medical technology, we can continue to build and to be recognized, as an integral part of the medical profession.

NOTICE!

SECOND ANNUAL NATIONAL PAPER WRITING CONTEST

This contest is open to all registered medical technologists (ASCP) but only members of the ASMT may compete for the national convention prizes.

This notice is an invitation for every registered medical technologist to participate and is also an invitation to each affiliated organization in the ASMT to sponsor the contest. Any medical technologist (ASCP) without any local affiliation may participate by direct communication with the national paper writing contest chairman.

To make for unity each organization sponsoring a division of the contest will conform as best it can with the following regulations:

1. File date of entry of contest with the national chairman promptly.

2. Maintain communications with said chairman while contest is in progress.

3. Designate some qualified member of the organization as a chairman of a Committee on Awards, who shall at all times be responsible for transfer of manuscripts from author to judges and to the national convention program committee chairman.

4. Complete the local committee by choosing three distinguished pathologists to evaluate the manuscripts.

5. Offer cash prize awards for the first and second best papers, and honorable mention for other papers of merit.

6. Publish prize papers in local medical technology bulletin or journal.

7. Forward the prize winning papers to the Chairman of the Program Committee of the annual convention ASMT for further evaluation, possible publication, and reading by the author or by proxy at the national annual convention scientific program.

8. Observe these dates:

a. Start the contest September 9, 1946, or soon thereafter.

b. Close the contest February 1, 1947.

c. Forward prize papers to the Chairman of the Program Committee of the annual convention ASMT, not later than March 1, 1947.

9. Shall, if they so desire, use the manuscripts submitted by their own members to build up the state's convention program.

10. Shall permit the Chairman of the Program Committee of the ASMT to build from these scientific papers the convention program for 1947, insofar as the medical technologists' contribution is concerned.

Each affiliated organization sponsoring the paper writing contest shall see that each contestant:

a. Writes on some phase of medical technology.

b. Produces a paper not exceeding twenty minutes reading time. (No ceiling on minimum length.)

c. Types on regular size typewriting paper, double space, making four copies. (This provides enough copies for evaluation by several judges, for press publicity, and possible Journal publication.)

d. Forwards paper to the Chairman of the local committee on paper writing.

e. Observes the dates scheduled.

Writing papers is like a boomerang—the good comes back to you. Writing papers is professional—it should be the distinction of the ASMT. There is enough latitude in the contest rules that any prospective author can find something interesting to write up in a scientific manner. It may be academic in nature; it may be the report on a case study; it may be a report of some research; it may be a narration of experiences. These remarks are merely suggestive.

We remind you again, the contest starts September 9, 1946, and is open to all registered medical technologists and those of the ASMT may compete for convention prizes on their papers.

Signed: Sr. M. Alcuin, OSB, Chairman
Paper Writing Contest Committee.

STATE AND LOCAL SOCIETIES

One medical technologist alone can speak, but he cannot have a very strong voice in matters of policy or procedure. When that medical technologist is a member of a local society of medical technologists, he is a part of a group that is respected in his community. When he belongs to his state organization, which is, in turn, affiliated with the American Society of Medical Technologists, he is in a position to speak as one of a strong professional group. Finally, to belong to the national association also is a "must" for every person who practices a profession. Each member of the ASMT surely is acquainted with at least one other registered medical technologist who is not a member of the association. At present only 20 per cent of the active registered medical technologists (ASCP) are members of the national organization. We are not yet strong enough numerically to have representation on the Board of Registry. The trend of opinion seems to be that when the ASMT is large enough numerically, we shall have that privilege. During the next few years we should realize our ambition.

So let us begin now to bend our efforts toward more complete organization of the registered medical technologist, first, locally, then statewide, and finally nationally. This section will serve as an "exchange" for ideas. Please send your suggestions to the editor.

Below are listed some of the summertime activities of one local* organization:

1. A census is being taken of all "laboratory workers" in the city. These will be checked to find which of the non-registered people are eligible for an associate membership in the society (an associate member in this particular organization is one who is eligible for registration but who has not taken his examination, or he is a student technologist, or has had his training under a pathologist prior to the time when college training was a prerequisite, and is taking his college work at night school in a local

* HCSMT, Houston, Texas

university). The list of registered medical technologists in any city is available at the Executive Office of the ASMT.

2. A letter has been prepared and will soon be sent out to all registered MTs (ASCP) in the city, and prospective associate members. This letter is to announce something of the tentative program for the next year's activities, as well as a meeting to be held in July at which a report of the national convention will be made.

3. A tentative program for the year has been planned. This consists of talks by local doctors and technologists as well as panel discussions and practical demonstrations.

A small group can plan to meet and study technics regularly. A review of so-called routine procedures can become most "unroutine" when an interested group meets and each person has something to offer in the line of some cases he has encountered.

A number of local organizations have already signified their intention to take advantage of the plan of the Registry to assist with seminars. The Education Committee of the ASMT will assist with these plans. You may learn more of this by writing to the Executive Office of the ASMT, or to the Chairman of the Education Committee, Miss Rachel Lehman, 3939 North Capitol, Indianapolis, Indiana. The study sets of slides will also prove good program material. Use your Education Committee.

Below are listed the approximate number of registered medical technologists (ASCP) (as of September 1945) in each city in the United States where there is "potential" for local organization. In some of these there may already be a city or county society. Please let us have that information. Send us a list of your officers so that the secretary, at least, may be made known through the pages of the Journal. If there is a state society which is not affiliated with the national association, write the Executive Office for information on "how to affiliate." If there is no state organization, call on your district counsellor (see May Journal for list), for assistance.

Miss Mary Wood, MT (ASCP), 102 So. Naches Ave., Yakima, Washington, has been appointed Counsellor for the Northwestern District, composed of the states of Washington, Oregon, and Idaho.

Miss Jeanne Jorgenson, M.T. (ASCP), 115 Frederick St., San Francisco 17, California, will be the Counsellor for the Western States District. This district is composed of the states of California, Nevada, and Utah.

State City	No. of MT(ASCP)	Organization Affiliation
ALABAMA	100	None
Birmingham	51	
ARIZONA	50	
Tucson	11	
Phoenix	29	
ARKANSAS	97	ASMT 16
Little Rock	39	State
Hot Springs	11	
CALIFORNIA	634	None
San Diego	38	State
San Francisco	103	State
Palo Alto	9	
Pasadena	18	
Loma Linda	13	
Oakland	14	
Long Beach	25	
Santa Barbara	14	State
Los Angeles	119	State
Berkeley	22	State
COLORADO	242	ASMT 7
Denver	155	None
Pueblo	13	
Colorado Springs	19	
CONNECTICUT	95	
Stamford	6	
New Haven	8	
Waterbury	8	
Bridgeport	9	
Hartford	16	
DELAWARE	24	
Wilmington	16	
FLORIDA	173	
St. Petersburg	13	
Tallahassee	5	
Tampa	13	
W. Palm Beach	9	
Miami Beach	9	
Jacksonville	26	
Orlando	11	
GEORGIA	163	
Savannah	23	ASMT 12
Atlanta	69	
IDAHO	34	
Boise	10	
ILLINOIS	597	ASMT 10
Chicago	247	ASMT 4
Rockford	17	
Springfield	25	
Peoria	23	
Evanston	28	
Oak Park	15	
Waukegan	10	
INDIANA	230	ASMT 8
Indianapolis	59	ASMT 17
South Bend	8	
Terre Haute	9	
Evansville	8	
Lafayette	12	
Ft. Wayne	13	
Muncie	11	
IOWA	102	
Des Moines	10	
KANSAS	202	
Kansas City	34	
Lawrence	10	
Wichita	30	
Topeka	15	
KENTUCKY	225	ASMT 2
Louisville	108	
Lexington	23	
LOUISIANA	169	ASMT 18
New Orleans	93	
Shreveport	38	State
MAINE	50	
Portland	15	
MARYLAND	158	
Baltimore	65	
Bethesda	23	
MASSACHUSETTS	248	
Worcester	32	ASMT 20
Pittsfield	15	
Springfield	10	
Boston	28	
MICHIGAN	471	None
Detroit	231	
Grand Rapids	20	
Kalamazoo	16	
Pontiac	14	
Ann Arbor	21	
Lansing & E. Lans.	24	
*MINNESOTA	361	ASMT 5
Duluth	34	State
Minneapolis	139	State
St. Paul	73	State
Mankato	5	State
MISSISSIPPI	56	
MISSOURI	326	
St. Louis	96	
St. Joseph	10	
Kansas City	120	
Springfield	22	

* Minnesota has five districts organized and affiliated with the state society. These districts cover the whole state. For details of their organization, write to Sr. M. Alcuin, College of St. Scholastica, Duluth 2, or to Miss Frieda Claussen, 469 Laurel Ave., St. Paul.

State City	No. of MT(ASCP)	Organization Affiliation
MONTANA	83	
Anaconda	7	
Billings	11	
Butte	9	
Missoula	10	
Great Falls	17	
NEBRASKA	98	ASMT 3
Omaha	45	State
Lincoln	20	
NEVADA	12	
Reno	8	
NEW HAMPSHIRE	57	None
NEW JERSEY	243	None
Irvington	9	
Newark	25	
Elizabeth	7	
Patterson	14	
Jersey City	11	
Orange	12	
Atlantic City	9	
NEW MEXICO	31	
Albuquerque	10	
NEW YORK	574	
Buffalo	66	ASMT 15
Brooklyn	36	
Rochester	24	
Staten Island	12	
Utica	13	
Elmira	10	
New York	99	
Bronx	10	
NORTH CAROLINA	249	
Durham	23	
Winston-Salem	11	
Raleigh	10	
Charlotte	17	
NORTH DAKOTA	49	
Minot	10	
Grand Forks	8	
Fargo	10	
OHIO	444	ASMT 14
Cincinnatti	54	
Cleveland	71	
Shaker Heights	6	
Cleveland Heights	9	
Dayton	33	
Toledo	28	
Akron	26	
Columbus	45	
Canton	9	

State City	No. of MT(ASCP)	Organization Affiliation
OKLAHOMA	123	ASMT 6
Oklahoma City	52	State
Tulsa	50	State
OREGON	101	
Portland	90	
Salem	11	
PENNSYLVANIA	713	ASMT 11
Philadelphia	200	**Penna. SMT&LT
Pittsburg	60	State
Allentown	20	
Erie	12	
Reading	18	
Harrisburg	11	
Bethlehem	18	
Wilkes Barre	10	
Johnstown	10	
Morristown	9	
Scranton	8	
Lancaster	9	
Danville	8	
RHODE ISLAND	20	
SOUTH CAROLINA	86	
Columbia	15	
Charleston	28	
SOUTH DAKOTA	31	
Sioux Falls	8	
TENNESSEE	166	
Memphis	79	
Nashville	19	ASMT 19
Knoxville	9	
Chattanooga	6	
Jackson	7	
TEXAS	634	ASMT 1
Houston	81	None
Fort Worth	38	None
Beaumont	20	
Austin	22	None
Amarillo	12	
Corpus Christi	12	
Dallas	93	
El Paso	13	
Temple	18	
Galveston	25	
San Antonio	67	None
Waco	13	
Wichita Falls	6	
Port Arthur	5	
Lubbock	8	
UTAH	57	
Salt Lake City	39	
VERMONT	18	
Burlington	8	

State City	*No. of MTS (ASCP)*	*Organiza- Affilia- tion*
VIRGINIA	251	
Harrisonburg	8	
Portsmouth	7	
Roanoke	10	
Staunton	10	
Alexandria	12	
Richmond	57	
Charlottesville	23	
Arlington	18	
Norfolk	34	
WASHINGTON	206	
Richland	9	
Ft. Lewis	7	
Tacoma	19	
Spokane	32	
Seattle	76	
WEST VIRGINIA	73	
Huntington	14	
WISCONSIN	311	ASMT 13
Madison	46	State
La Crosse	7	
Superior	8	
Wauwatosa	10	
Green Bay	9	
Wausau	7	
Milwaukee	110	State
WYOMING	15	
Cheyenne	7	
WASHINGTON D.C.	113	ASMT 9

In the smaller states where there are a very few medical technologists, the organizations may have the opportunity to function similarly to the county or district societies of larger states. They might arrange to meet bi-monthly. At any rate, they have an excellent opportunity to become closely knit units.

Those states which are not affiliates of the national organization should, this year, make every effort possible to take care of this situation. Those state organizations which do not have provision made for affiliating their local or county societies also have the opportunity to fulfil an obligation.

Let us give the Advisory Committee a chance to have a really interesting and constructive report at our 1947 convention.

COLORADO

Colorado Society of Medical Technologists—last annual convention held June 9, 1946.

Scientific Program: Albany Hotel, Denver.

"The Application of Monomolecular Layers to Quantitative Biological Investigations"—Stanley M. Weiner.

"The Colloidal Gold Test—Qualitative and Quantitative"—Pauline Kurachi, MT (ASCP).

"Cutting Oils and Coolent Solutions"—Gladys Geraghty, MT (ASCP).

"Laboratory Survey of Malaria Inoculata"—Willie R. Herzberger, MT (ASCP).

"The Dawn of Medical Technology"—Philip Hillkowitz, M.D.

"Duodenal Drainage and Analysis of Duodenal Contents"—Wayne H. Danielson, Ph.D.

"The Laboratory Diagnosis of Trichinosis"—James B. McNaught, M.D.

"The Cell—1946"—Carl W. Maynard, M.D.

Officers—1946-47: President—Elizabeth O'Toole, Colorado General Hospital, Denver.

President-elect—Lavina White, Colorado State Hospital, Pueblo.

Corresponding Secretary—Pauline Kurachi, Colorado State Hospital, Pueblo.

Recording Secretary—Dorothy Batson, St. Anthony's Hospital, Denver.

Treasurer—Virginia Wier M., Suite 1104 Republic Bldg., Denver.

Denver Society of Medical Technologists—Regular meetings: first Thursday each month from September to June.

Officers—1946-47: President—Rose Hackman; President-elect—Philippine Dixon; Recording Secretary—Renee Allen; Treasurer—Evelyn Pellillo;

Corresponding Secretary—Lola Dixon, Clinical Laboratory, Children's Hospital, Denver, Colorado.

GEORGIA

Savannah Society of Medical Technologists: Meetings held monthly—first Tuesday.

Officers—1946-47: President—Betty Paulson; Vice President—Jurelle Hooper; Secretary & Treasurer—Eugenia Tarver, address not given.

LOUISIANA

Louisiana State Society of Medical Technologists: Second Annual Convention held May 4 and 5, 1946, at Hotel Bentley, Alexandria.

Scientific Program:

"Sickle Cell Anemia in Children"—Estelle Honaker, Shreveport Charity Hospital.

"Rabies"—Helen Lawrence, State Dept. of Health, Shreveport.

"The Effect of Sulfa Drugs on the Blood"—Gloria Savarese, New Orleans.

"Dental Caries"—First Award—Lucille Godelfer, State Dept. of Health, New Orleans.

"Newer Developments in the Use of Plasma Proteins"—S. George Wolfe, M.D., Shreveport.

"Abnormal Strains of P. vivax"—John G. Arnold, Ph.D., Loyola Univ.

"The Use of Penicillin in the Treatment of Peritonitis (an Experimental Study), Timothy Duggan, M.D. Loyola Univ., New Orleans.

Banquet speakers were Dr. O. B. Owens, Alexandria, on "Socialized Medicine" and Hermine Tate on the annual convention highlights of ASMT.

Officers—1946-47: President—Lucille Godelfer, New Orleans; President-elect—Ineze Jordan, Alexandria; Secretary—Anna Harnan, 4532 South Tonti St., New Orleans; Treasurer—Rosabel Shavin, Shreveport; Executive Committee—Hermine Tate, Lafayette; Hazel Newton, New Orleans; David Stell, Alexandria.

Advisory Board Members—Dr. W. R. Mathews, Shreveport; Dr. G. H. Hauser, New Orleans; Dr. E. H. Lawson, New Orleans.

Caddo Parish Society of Medical Technologists (Shreveport): Monthly meetings.

Officers—1946-47: President—Dorothy Edwards; Secretary—Edna Caulfield, 1706 Buckner St., Shreveport; Vice President—Estelle Honaker; Program Chairman—Eola Kendrick.

NEBRASKA

Nebraska Society of Medical Technologists: Annual meetings.

Officers—1946-47: President—Ruth Pohle, University Hospital, Omaha; Secretary—Jean Ellison, Nebraska Methodist Hospital, Omaha.

MINNESOTA

Minnesota Society of Medical Technologists: Last annual convention held on May 26 and 27, 1946, Lowry Hospital, St. Paul.

Convention theme: "A Challenge of the Future."

Officers—1946-47: President—Eileen Smith; President-elect—Jane Maghan; Vice President—Lillian Sigford; Treasurer—Frances Casey; Secretary—Jean B. Nelson, St. Mary's Hospital, Duluth; Past President—Esther Wilbrecht; Board Members—Eleanor Eggleston, Catherine Hanitch, Emma Munns.

MICHIGAN

Michigan Society of Medical Technologists: Newly organized.

Officers—1946-47: President—Edna Lunecke; Secretary—Aino Osterberg, 9556 Burnette, Detroit 4, Michigan.

OKLAHOMA

Oklahoma Society of Medical Technologists: Last annual convention held May 4 and 5, 1946, at the Biltmore Hotel, Oklahoma City.

Scientific Program:

"Parasites to be Encountered in Returning Veterans"—Dr. Donald B. McMullen.

"Some Features of the Rh Factor"—Dr. Homer F. Marsh.

"The Leukemias"—Dr. Russell Haden, Banquet Speaker.

"Bone Marrow"—Dr. Russell Haden.

Officers—1946-47: President—Vernal Johnson, Oklahoma City; Vice President—Lythene Vermillion, Tulsa; Secretary-Treasurer—Eleanor Calloway, Tulsa; Corresponding Secretary—Margaret Haraway, 1115 Med. Arts Bldg., Oklahoma City 2, Okla.

PENNSYLVANIA

Pennsylvania Society of Medical Technologists and Laboratory Technicians: Monthly meetings held—Last annual business meeting held May 13, 1946, at Philadelphia Co. Medical Society, 21st & Spruce, Philadelphia, Pennsylvania.

Officers—1946-47: President—Henrietta Lyle, Maple Manor, Columbia, Pa., R.D. No. 2; President-elect—Eleanor Stackhous; Corresponding Secretary—Elizabeth Heck, 301 South 21st St., Philadelphia 3, Pa.; Recording Secretary—Helen Breen; Advisory Board—Elsa Lynch, Anne Caverly; Honorary Advisory Board—Dr. Stanley Reimann.

Western Pennsylvania Chapter of the PSMT & LT: Last annual business meeting held at St. John's Hospital, Pittsburgh, May 18, 1946.

Officers—1946-47: President—Romayne Teufel; President-elect—Dorothy J. Flohr; Corresponding Secretary—Frances H. Jackson; Recording Secretary—Patricia Waters, 1207 Christopher St., Johnstown, Pa.; Treasurer—Sr. M. Salome.

TEXAS

Texas Society of Medical Technologists: Last annual convention held April 12 and 13, 1946, at Hotel Plaza, San Antonio, Texas.

Officers—1946-47: President—Paul Lea, Lubbock; President-elect—Sr. M. Bridgetine Glass, San Antonio; Vice President—Vondell Stewart, Houston; Secretary—Genevieve Schneider, Harris Memorial Methodist Hospital, Fort Worth; Treasurer—Betty McGrew, Austin.

Board Members—Mary Allen, Dallas; Sr. M. Stella O'Sullivan, Amarillo; Lucile Harris, Abilene; Estelle Boyd, Yoakum; Mrs. Mattie Gaston, Falfurias; Miss Minnie Sporer, Tyler.

Harris County Society of Medical Technologists (Houston): Monthly meetings.

Officers—1946-47: President—Margaret Zalesky; Vice President—Sr. M. Aniceta; Secretary-Treasurer—Mrs. Mildred Peel, St. Joseph's Infirmary; Program Chairman—Mary Nagai.

Above data corrected as of July 1, 1946. Any listings not appearing in this issue are omitted because of lack of confirmation of names or dates.

Please send data for this section to the office of the editor, 2119 Arbor Ave., Houston 4, Texas, before the 20th day of the month preceding publication of Journal.

AT HOME OR AWAY

SPOT TESTS

SIMPLIFY URINALYSIS

NO TEST TUBES · NO MEASURING
NO BOILING

Diabetics welcome "Spot Tests" (ready to use dry reagents), because of the ease and simplicity in using. No test tubes, no boiling, no measuring; just a little powder, a little urine—color reaction occurs at once if sugar or acetone is present.

Galatest

FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (DENCO)

FOR DETECTION OF ACETONE IN THE URINE

SAME SIMPLE TECHNIQUE FOR BOTH

1. A LITTLE POWDER 2. A LITTLE URINE

COLOR REACTION IMMEDIATELY

A carrying case containing one vial of Acetone Test (Denco) and one vial of Galatest is now available. This is very convenient for the medical bag or for the diabetic patient. The case also contains a medicine dropper and a Galatest color chart. This handy kit or refills of Acetone Test (Denco) and Galatest are obtainable at all prescription pharmacies and surgical supply houses.

Accepted for advertising in the Journal of the A.M.A.

WRITE FOR DESCRIPTIVE LITERATURE

Acetone Test (DENCO)...*Galatest*

The Denver Chemical Manufacturing Co., Inc.

163 Varick Street, New York 13, N.Y.

Hellige-Diller

PHOTOELECTRIC COLORIMETER

"Bio-PhotoCol"

A thoroughly developed Photoelectric Colorimeter, calibrated for 56 biochemical procedures, more complete than any other instrument offered for this purpose.

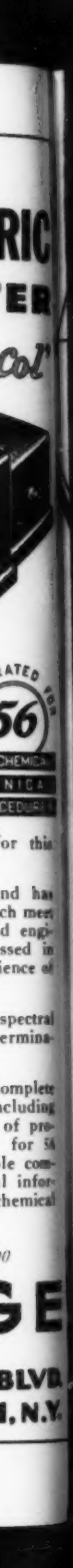
The Colorimeter is linear and has utmost differential responses which meet every requirement, electrical and engineering detail, and is unsurpassed in regard to simplicity and convenience of operation.

Six light filters of narrow spectral transmission ranges enable determinations of highest accuracy.

The Colorimeter is supplied complete with all necessary accessories including a handbook containing outlines of procedures and calibration tablets for 56 bio-chemical tests and a valuable compilation of helpful and practical information concerning clinical bio-chemical methods.

Write for Bulletin No. 500

HELLIGE

INCORPORATED

3718 NORTHERN BLVD.
LONG ISLAND CITY 1, N.Y.